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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/844,186	04/27/2001	Jacek Tadeusz Gabzdyl	M00B107	2157

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The BOC Group, Inc.
Intellectual Property Department
100 Mountain Avenue
New Providence, NJ 07974

EXAMINER
PITTMAN, ZIDIA T

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/844,186	Applicant(s) GABZDYL, JACEK TADEUSZ	
	Examiner Zidia Pittman	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waldron et al (USPN 6,168,067) in view of Bottiglia (USPN 4,296,300).

Waldron et al teaches high strength friction stir welding. The structural members are joined to one another by friction stir welding along the interface of the members, which defines a welding path between the members. A rotating friction stir welding tool is forced through the outer surfaces of the structural members. The frictional heat generated by the rotating probe creates a plasticized region or weld zone between the structural members. The rotating probe is then moved along the path defined by the interface between the structural members to thereby form a continuous friction stir weld joint along the length of the members, thus forming a unitary-structural assembly. The

size of the heat-affected region may be reduced by applying a continuous stream of cooling fluid through one or more coolant jets. Preferably, the cooling fluid is applied to the weld zone immediately behind the friction stir welding probe. In another embodiment, the stream of cooling fluid may be applied in multiple locations to the area of the structural members. The cooling fluid may include any non-reactive liquid coolant or chilled gas. In a preferred embodiment, the cooling fluid includes chilled nitrogen gas. The work piece may be an aluminum alloy. (column 3 line 50 – column 4 line 5; column 4 line 49 – column 5 line 54)

Waldron et al does not specifically teach that the cooling fluid utilized is a cryogen.

Bottiglia teaches a method for welding protected metal parts. The welding zone is cooled by a cryogenic substance, namely liquid nitrogen. (abstract; column 2 lines 37-65)

Both Waldron et al and Bottiglia relate to thermal welding processes.

At the time of the invention, it would have been obvious to one having ordinary skill in the art to modify the teachings of Waldron et al with the teachings of Bottiglia by utilizing a cyrogenic cooling fluid, namely nitrogen in order to result in an abrupt temperature change that does not disturb the joined workpieces.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waldron et al in view of Bottiglia as applied to claim 2 above, and further in view of Soviet Union Patent (SU-414066).

Waldron et al in view of Bottiglia teaches all the limitations of claim 4 as stated above for claim 2 except for teaching that the liquid cryogen is nitrogen

Soviet Union Patent teaches argon-arc welding. Resistance of argon arc welds against thermal crack formation is ensured by using liquid argon or nitrogen for forced cooling of the weld with cooling streams directed against the movement of the welding head. (abstract)

At the time of the invention, it would have been obvious to one having ordinary skill in the art to modify the teachings of Waldron et al in view of Bottiglia with the teachings of the Soviet Union Patent in order to protect the friction stir weld against thermal crack formation. Argon-arc welding and friction stir welding are types of thermal welding.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waldron et al in view of Bottiglia as applied to claim 1 above, and further in view of Terai et al (USPN 3,836,748).

Waldron et al in view of Bottiglia teaches all the limitations of claims 5 and 6 as stated above for claim 2 except for teaching that the liquid cryogen is nitrogen.

Terai et al teaches a process of welding a high tension steel by metal arc inert gas welding. The sub-zero treatment is conducted by contacting the weld metal with any suitable coolant. The particular coolant used is not critical, and examples are dry ice, mixtures of dry ice with methyl or ethyl alcohol, and liquid nitrogen. (column 1 lines 31-35; column 3 lines 5-15)

At the time of the invention, it would have been obvious to one having ordinary skill in the art to modify the teachings of Waldron et al in view of Bottiglia with the teachings of Terai et al in order to provide a process of welding without softening or crack formation at the heat-affected portion of the welded metal. Metal arc inert gas welding and friction stir welding are types of thermal welding.

Response to Arguments

Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed October 22, 2002 have been fully considered but they are not persuasive.

In response to applicant's argument regarding the differences between friction stir welding processes and arc welding processes with regards to the use of cryogenic materials to cool the weld zones, the examiner submits that all welding processes depicted by the references are thermal welding processes. Each process relates to the joining of metallic materials and efficient ways in which to cool the weld zone with low temperature materials without degradation of the welded metallic materials.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zidia Pittman whose telephone number is (703) 305-1248. The examiner can normally be reached on Monday – Thursday and alternate Fridays from 8:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn, can be reached at (703) 308-3318. The official fax phone number for the organization where this application or proceeding is assigned is (703) 305-7718. The unofficial fax number for art unit 1725 is (703) 305-6078.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

3TP
01/12/03

TOM DUNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700